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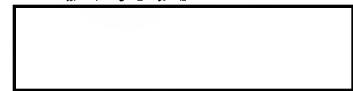
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MARCH 1971

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**DIRECTORATE OF
INTELLIGENCE**

Intelligence Memorandum

Guinea's Bauxite Bonanza

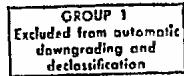
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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
March 1971

INTELLIGENCE MEMORANDUM

Guinea's Bauxite BonanzaIntroduction

Bauxite occupies a dominant position in Guinea's economy. It is Guinea's most important mineral resource, and exports of alumina and bauxite ore are an important source of foreign exchange.* Mining is the only sector of the Guinean economy relatively free from the capricious economic policies of President Sekou Toure's brand of radical socialism. Moreover, despite Toure's outspoken support of Communist nations, Western capitalists, as well as the USSR, are being allowed to develop bauxite mines. Toure's violent reaction to the attempted military invasion of November 1970 prompted fears, as yet unfounded, for the progress of the Western projects. This memorandum examines Guinea's bauxite industry in detail and assesses its contribution to the country's economic development.

Background

1. On the eve of independence in 1958, Guinea's economic prospects were bright. Much of its 95,000 square miles was suitable for agriculture; the

* Bauxite is a clay-like ore from which aluminum is obtained; alumina (aluminum oxide) is an intermediate product used in the manufacture of aluminum metal.

Note: This memorandum was prepared by the Office of Economic Research and coordinated within the Directorate of Intelligence.

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country was nearly self-sufficient in rice and cassava, its principal food crops; and bananas, coffee, palm kernels, pineapples, and peanuts were exported. Ample forests, coastal waters abundant with fish, and rivers with considerable hydroelectric potential were available for development. Bauxite, iron ore, and diamond exports accounted for nearly 75% of the foreign exchange earned. Bauxite reserves were enormous, and private firms had already committed an initial investment of US \$140 million in a large bauxite project.

2. After independence, Guinea replaced its French-style economic system with one based on the radical socialist philosophy of its new president, Sekou Toure. All French colonial officials were withdrawn, and many French entrepreneurs left. Virtually all important economic activity, except most mining and agriculture, was brought under direct government control and ownership. The monetary sector, formerly run by French technicians, was taken over by advisers from Communist countries. Foreign trade shifted markedly toward Communist countries, largely through bilateral payments agreements. The government accelerated investment in infrastructure, industry, and social welfare, with emphasis on education.

3. After more than a decade of independence, Guinea is in financial straits, and the economy is stagnant. Investment during the first six years of the seven-year development plan (1964-71) was about \$270 million, exclusive of bauxite investment, but per capita GNP remained unchanged at about \$75. Export receipts failed to grow, stabilizing at about \$50 million annually. Price controls, a lack of production incentives, plant disease, and difficulties arising through government marketing services caused agricultural exports to stagnate well below the 1960 level and led to considerable smuggling of agricultural export products, particularly coffee. A scarcity of foreign exchange and a resultant government decision to limit imports well below earlier levels led to further smuggling, black market activity, and a shortage of raw materials and essential producer goods. These shortages, in turn, kept state enterprises operating well below capacity. Guinea's ordinary

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budget, which does not include development expenditures, has been in deficit since 1966/67, mainly because of the decline in customs receipts. Although ordinary budget expenditures have grown somewhat, because of higher government payrolls, expenditures for maintaining infrastructure actually declined. The ordinary budget since 1965/66 is as given in the accompanying tabulation.

	Million US \$			
	<u>1965/66</u>	<u>1966/67</u>	<u>1967/68</u>	<u>1968/69</u>
Revenue	65.6	58.2	50.1	54.8
Expenditures	65.6	61.0	71.7	69.9
<i>Deficit</i>	-	- 2.8	- 21.6	- 15.1

4. Guinea's foreign exchange receipts were nearly depleted early in the 1960s; persistent current account deficits (see Table 1) have been financed by a net inflow of official grants and capital and by increased indebtedness on bilateral accounts. By the end of 1969, medium- and long-term debt had accumulated to \$235 million -- \$148 million held by Communist countries. Drawings from the International Monetary Fund (IMF), the release of blocked pension funds by France, and the initial allocation of Special Drawing Rights enabled Conakry to increase its foreign assets to nearly \$19 million in June 1970 (equal to about four months' imports), but net foreign assets were negative as shown in the following tabulation.

	Million US \$			
	<u>Sep 1967</u>	<u>Sep 1968</u>	<u>Sep 1969</u>	<u>Jun 1970</u>
Foreign assets	6.0	8.0	14.2	18.9
Foreign liabilities <u>a/</u>	-30.8	-44.1	-44.5	-53.5
<i>Net foreign assets</i>	-24.8	-36.1	-30.3	-34.6

a. Foreign liabilities include short-term convertible currency liabilities, purchases from the IMF, and bilateral balances (excluding balances consolidated into long-term debt).

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Table 1

Guinea: Summary of Balance of Payments a/

	Million US \$		
	1966/1967	1967/1968	1968/1969
Exports	50.9	52.9	49.4 b/
Imports	-53.3	-54.5	-56.8 b/
Balance of trade	- 2.4	- 1.6	- 7.4
Invisibles (net)	-21.0	-15.7	-19.2
Current account balance	-23.4	-17.3	-26.6
Capital (net)	17.7	10.5	30.3
Private	--	(1.1)	(1.8)
Official	(17.7)	(9.4)	(28.5)
Errors and omissions	- 5.6	- 4.5	2.1
Overall balance	-11.3	-11.3	5.8

a. On a financial year basis (1 October-30 September).

b. Preliminary estimates.

5. In the hope of generating some economic momentum, Toure has concentrated on developing the country's bauxite resources. Production, which began in 1952, has averaged about 2 million metric tons a year since 1960. Gross foreign exchange receipts from bauxite and alumina exports, which in 1970 were about \$37 million, have accounted for about two-thirds of merchandise exports. After foreign exchange costs, profit repatriation, and debt repayment, however, only some \$12 million remained available to the Guinean government.

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6. Despite a firm and longstanding commitment to socialism, Toure has turned mainly to private foreign investors to carry out this crucial development. Even with the turmoil and apprehension following the Portuguese directed attacks on Guinea in November 1970 -- the expulsion of expatriates, failure to issue visas, truck requisitions, and excessive absences of workers -- the major Western project has not been delayed appreciably.

Guinea's Bauxite Industry

World Position

7. Guinea has about 20% of the world's known bauxite deposits but ranks only seventh in production. Its largest and richest deposits have yet to be tapped, and one of its two operating installations is quite small. Bauxite production in 1970 was about 3 million tons -- about 5% of world production. One-third was exported as bauxite, and the balance was processed and exported as alumina. The projects now under way and planned could raise output to perhaps 13 million tons and move Guinea to third place among world producers by 1975 (see Table 2). Most of this output will be processed by the producing firms, and disposing of the balance should not be difficult.

Tamara

8. Since 1967 the American-owned Harvey Aluminum Company has been mining a relatively small deposit on the island of Tamara, near Conakry, to supply its alumina plant in the Virgin Islands (see Table 3). In 1969, output on Tamara was 750,000 tons, and in 1970 production reached full capacity -- 1 million tons. Harvey delivers up to 40% of Tamara's production to the government-owned Kassa Company* for payment in local currency. The

* A small deposit on the island of Kassa near Conakry was the first to be mined (see the map). Production reached a high of 500,000 tons in 1960 under a French subsidiary of Alcan and then dropped to about 55,000 tons after the mine was nationalized in 1962. Czech, Polish, and Hungarian technicians assisted the Guineans in operating the mine after nationalization, and production grew to about 200,000 tons in 1967, at which time the deposit was exhausted.

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Table 2

World Production of Bauxite

	<u>Million Metric Tons</u>	
	<u>1969 a/</u>	<u>1975 b/</u>
Jamaica	10.5	20.0
Australia	7.9	15.5
Surinam	5.5	Substantial expansion planned
USSR	5.0	Exploration active
Guyana	3.8	-- c/
France	2.8	--
Guinea	2.5	10-13.5
Yugoslavia	2.1	Substantial expansion planned
World	52	--

a. Source for Free World countries: US Bureau of Mines.

b. Estimated.

c. Expansion plans unknown, due to threat of nationalization.

Kassa Company exports its share of the bauxite through the state-owned Guinexport, with most of the ore going to Communist countries, primarily for payment of debt. Guinea also receives 50 cents a ton for all bauxite sold by Harvey. Recent shipments from Tamara have been of poor quality, and the deposit is expected to be exhausted by about 1973.

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Table 3

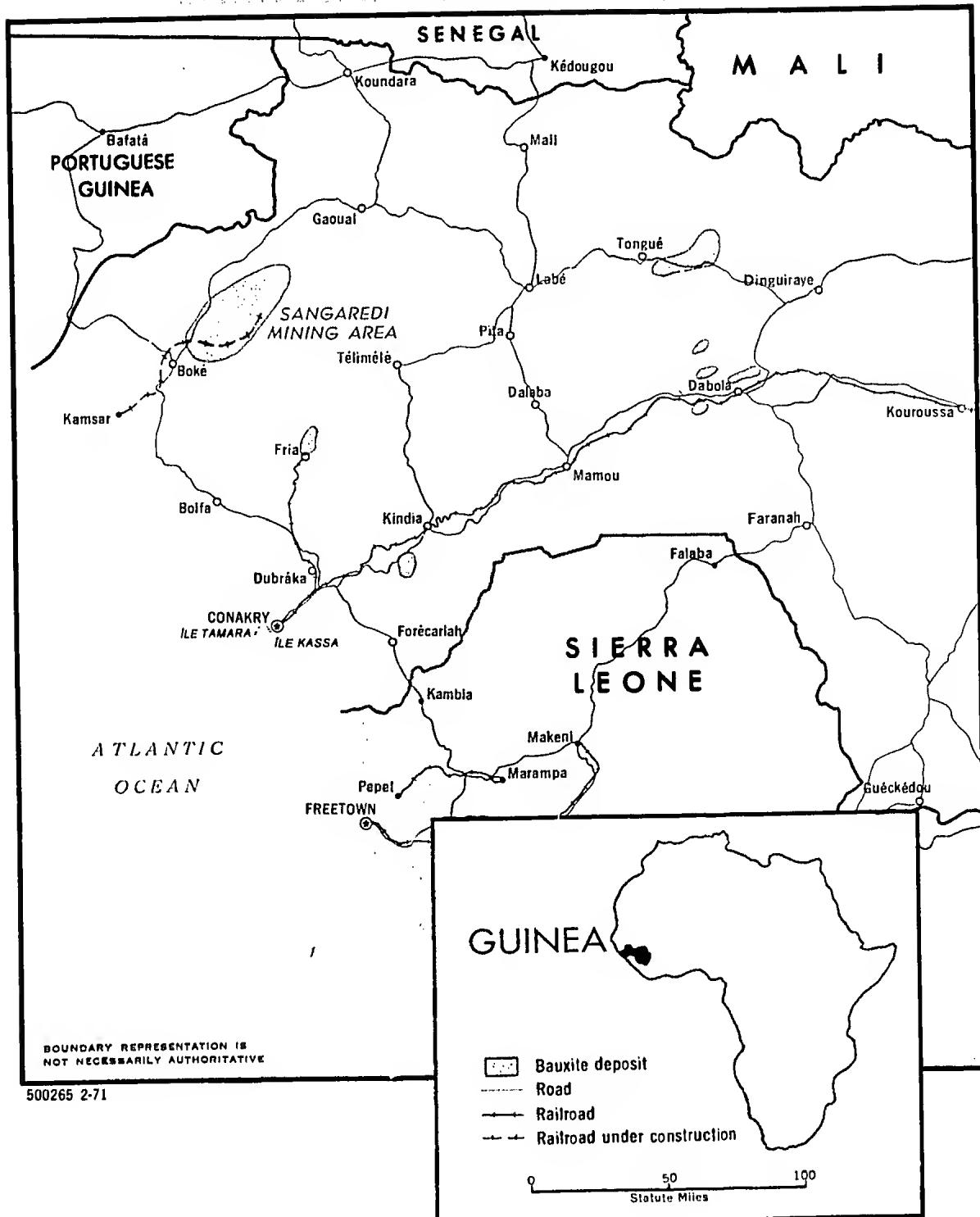
Bauxite Mining Operations in Guinea

Location	Ownership		Year of Startup	Estimated Reserves
	Organization	Percent		
Kassa	Societe des Bauxites du Midi (French subsidiary of Alcan), 1952-62 Guinean government (nationalized Kassa in 1962)		1952	Exhausted (1967)
Fria	FRIA (consortium) Olin-Mathiesen (US) Pechiney Ugine-Kuhlmann (France) British Aluminium Co. (UK) Aluminum Suisse S.A. (Switzerland) Vereinigte Aluminum Werke (West Germany)	48.5 26.5 10.0 10.0 5.0	1960	Over 250 million tons (1968)
Tamara	Harvey Aluminum Company (US)		1967	6-7 million tons (1966) expected to be exhausted by 1973 or 1974
Boke	Compagnie de Bauxite de Guine (CBG) Guinean government (49%) Halco (consortium) (51%) Alcoa (US) Alcan (Canada) Harvey Aluminum Pechiney Ugine Vereinigte Aluminum Werke Montecatini-Edison (Italy)	27.0 27.0 20.0 10.0 10.0 6.0	1973	1.75 billion tons (1968)
Kindia	Guinean government (Soviet financed)		1973	About 70 million tons
Tougue	Somiga (consortium) Guinean government Aluminum Suisse S.A. Others being sought		Possibly late 1970s	N.A.
Dabola				No planned exploitation to N.A. date

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FRIA

9. Guinea's major bauxite producer since 1960 has been the Compagnie pour la Production d'Alumine (called FRIA after a town situated near the mine). Production reached 1.8 million tons in 1969. The FRIA deposit, which contains at least 250 million tons of good-quality ore, is mined by open-pit methods. The alumina content of current production is about 58%-60%.

10. All bauxite produced by FRIA is processed into alumina near the mine before being shipped. The alumina is hauled to special storage and handling facilities at the port of Conakry and then is exported to Cameroon, Spain, Norway, France, and other countries for processing into aluminum metal. Since 1965, alumina output has ranged between 550,000 and 600,000 tons. A recent expansion increased capacity to 700,000 tons, and the Guinean government consistently has pressed FRIA to expand further to 1 million tons. The plant layout was designed for an eventual expansion to 2 million tons, and the deposits could easily justify such a rate for many years.

11. FRIA is owned by a consortium of private companies (see Table 3), which has invested a total of \$160 million. The consortium owns and operates the mining facilities, an alumina plant, a railway, certain port facilities at Conakry, and a town at Fria. Olin-Mathiesen (US) owns nearly 50% of the organization, but Pechiney Ugine of France has a predominant role in FRIA's management and administration. Pechiney was largely responsible for discovering the deposits and developing the present complex, and Pechiney's processes and techniques are used. The plant is administered by a three-man directorate-general: an administrator delegate (French), who resides mainly in Paris where he is in contact with the consortium partners; a secretary-general (Guinean) in Conakry; and a plant director (French). Olin's presence is felt mainly in Paris, where general policy is reviewed.

12. One-third of FRIA's gross foreign exchange earnings are deposited in a Swiss bank account for the Guinean government in exchange for Guinean francs, which are used to cover local operating

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costs. All foreign exchange costs of the FRIA operation are paid from the company's portion of foreign exchange earnings, leaving the government full use of its share. In 1969, when alumina production was 572,000 tons, the government received nearly \$12 million. The increase in production to 700,000 tons by 1971 will raise the government share to \$14 million, and an increase to 1 million tons (assuming a price of \$61 a ton) would bring the Guinean treasury \$20 million annually.

13. A striking aspect of the FRIA operation is its highly successful Africanization program. From the beginning, Conakry has insisted on a goal of 100% African labor and management. Because this requirement was built into the basic agreement, the company was forced to plan Africanization in a rational and orderly manner, incorporating its cost and necessary resource allocation as an integral part of the plant's functioning. In 1970, approximately 90% of the total work force was Guinean (see Table 4), and a number of important administrative and technical sections had 100% Guinean personnel, including the mine site, the railroad, the port, and the administrative units both at Fria and Conakry. Expatriate personnel are confined to certain technical functions and a number of senior managerial and supervisory positions.

Table 4
FRIA Africanization Data

	<u>Guinean Personnel</u>	<u>Expatriates</u>	<u>Total</u>
1962	967	412	1,379
1963	1,005	371	1,376
1964	1,100	341	1,440
1965	1,104	312	1,416
1966	1,143	288	1,431
1967	1,178	262	1,440
1968	1,186	223	1,409
1969	1,225	179	1,404
1970	1,238	148	1,386

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14. The company's elaborate and highly successful training program ranges from basic literacy courses to vocational, specialized engineering, technical, managerial, and administrative instruction. The most important element of FRIA's Africanization policy is its systematic upgrading of local personnel, under company auspices and at company expense. This process permits a continued upward flow of Guineans into positions once held exclusively by expatriates.

15. No loss in profitability in FRIA's operations has been reported from the Africanization program. Losses in worker productivity apparently are offset by the substantial savings effected by the withdrawal of expatriates, whose support costs and fringe benefits were high. Company officials estimate that Africanization is saving FRIA at least \$600,000 annually. While total employment has remained relatively constant since 1962, the portion represented by expatriates has dropped from 30% to 11%.

Facilities Under Western Development

Boke

16. Boke, scheduled to become operational in 1973, is Guinea's most ambitious bauxite project now in progress -- investment will total nearly \$185 million. Deposits in the Boke area are estimated at more than 1.75 billion tons of high-grade ore, among the world's largest. The project has a planned capacity of 8-10 million tons of bauxite annually and a capability for vast expansion. Originally, 4.7 million tons of metallurgical-grade ore were to be mined in the first year of operation, 5.6 million tons after five years, and 6.4 million tons by the fifteenth year. Recent information, however, indicates that production will increase from an initial 4.7 million tons to 8.0 million tons in the second year and level off at 9.0 million tons in the sixth year. Once operations are under way, some calcined bauxite, used for abrasives and in ceramics and commanding a higher price than metallurgical-grade ore, will be produced. Eventually, production will include 200,000 tons of calcined bauxite annually, but the project does not include plans to convert Boke bauxite to alumina locally.

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17. Unlike currently operating organizations, the mining company, Compagnie de Bauxite de Guinea (CBG), is owned jointly by the Guinean government (49%) and an international consortium, Halco (51%) (see Table 3). CBG is responsible for all mining preparations and will own the mine, mine township (Sangaredi), locomotives and rolling stock, and a processing plant and loading equipment at a specially constructed port. Financing the estimated \$99 million cost of mining preparations is Halco's responsibility. The Guinean government will finance the transport infrastructure, which will consist of a railroad, a port, and a new township near Kamsar on the coast. The Office d'Amenagement de Boke (OFAB) has been established to supervise infrastructure construction and subsequently to operate and maintain the facilities. To finance the infrastructure cost, the Guinean government obtained \$64.5 million from the International Bank for Reconstruction and Development (IBRD) to meet foreign exchange requirements and \$21 million from USAID to cover local currency costs. To limit inflation arising from local currency expenditures, the United Nations World Food Program is providing food as part of the pay for workers engaged in the construction of preliminary housing and the rail and road infrastructure.

18. The government will receive 65% of the CBG's net profits (revenue minus operating costs). From this share, debts to the IBRD (foreign currency) and AID (local currency) must be serviced. A Financial Assurances Agreement guarantees, however, that payment of the IBRD debt will not lower the government's share below 40% of the net profits. If necessary, CBG will advance the difference between the government's net income (see Table 5) and the guaranteed income, with the government repaying the advances in later years. Also, CBG and other users of the port at Kamsar are to be charged a fee to cover depreciation of port facilities.

19. Should the revised production goals be met, returns to Halco and the government would accelerate significantly (see Table 5). They then would earn more by the fifth year of operation (1977) than originally had been estimated for the 15th year. Over the first 15 years of operation, Halco would be able to net as much as \$220 million, compared with the \$120 million now planned, and the government \$310 million, compared with \$130 million originally planned.

Table 5

A Comparison of Income from Boke Based on Original and Revised Sales Projections

	Initial Year	Plan Estimates					Revised Estimates			
		1973	1974	1977	1982	1987	1974	1977	1982	1987
Sales (million tons)	4.7		5.2	5.4	6.6	6.6	8.0	8.2	9.0	9.0
<u>CBG operating account (million US \$)</u>										
Revenue	33.6	35.4	42.0	50.7	50.7	57.8	62.1	69.1	69.3	
Operating costs	25.6	26.0	25.1	21.8	15.4	27.0	26.1	22.0	16.4	
Pre-tax income	8.0	9.4	16.9	28.9	35.3	30.8	36.0	47.3	52.9	
Net income to Halco (35%)	2.8	3.3	5.9	10.1	12.4	10.9	12.6	16.6	18.5	
<u>Government income (million US \$)</u>										
Profits tax (65%)	5.2	6.1	11.0	18.8	22.9	20.0	23.4	30.7	34.4	
Advances from CBG a/	2.1	3.4	1.5	-1.6	-0.8	-2.1	--	--	--	
Depreciation charges to CBG and port users	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.8	
Gross income	8.1	10.3	13.3	17.9	22.9	18.7	24.2	31.4	35.2	
Less: IBRD, AID debt service	4.7	6.8	7.1	7.0	6.9	6.8	7.1	7.0	6.9	
Net government income	3.4	3.5	6.2	10.9	16.0	11.9	17.1	24.4	28.3	

a. Minus sign indicates a repayment.

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20. The revised production goals are feasible. No major capital expenditures would be required beyond those incorporated in the original operating cost estimates. Moreover, the revised operating cost estimates in Table 5 could be overstated. The primary determinant of CBG's production levels will be the ability to find markets.

21. CBG does not anticipate difficulty selling its bauxite. Recent long-run forecasts predict a tripling of Free World demand for aluminum over the next 30 years. Moreover, Halco is owned by six of the world's largest aluminum companies, and each has signed a firm 20-year contract for the purchase of sufficient bauxite to justify the project. The excellent quality of Boke bauxite and the desire by most aluminum producers to obtain raw materials from a number of different sources to insure continuity of supply further brighten CBG's prospects for selling production in excess of Halco members' requirements. Low ocean transportation costs and the proximity of European markets also are in Boke's favor. Several bids already have been received from aluminum producers who are not members of the consortium.

22. Halco has agreed to provide a training program similar to FRIA's for both CBG and OFAB. Halco is furnishing the technical assistance needed to construct and operate the mining project, has set up a training institute, and provides on-the-job training for Guineans with the ultimate objective of teaching locally recruited staff to man the operation. The declared intention of the government and Halco is that the Guinean citizens employed by OFAB in supervisory capacities shall be at least 75% of the total personnel thus employed by the end of the 1970s. Initial employment estimates for Boke include 1,050 Guineans and 150 expatriates.

Tougue

23. An agreement was signed in September 1970 for the exploitation of yet another bauxite deposit, near Tougue, which also calls for government equity participation. The government and Aluminum Suisse S.A., a participant in FRIA, would have shares -- apparently equal ones -- in two companies, Somiga and Intersomiga. Somiga would

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be based in Conakry and would exploit the Tougue deposit. Intersomiga would be based in Zurich and would participate in Project Atlanta, a venture for constructing an alumina plant in Wilhelmshaven, Germany. The alumina plant would have an annual capacity of 1 million tons, requiring from 2 million to 3 million tons of Tougue bauxite annually, depending on the quality of the ore. No date has been set for a complete feasibility study, let alone for the commencement of mining operations, but the magnitude of the operation and the necessary preparations imply a starting date for mining in the late 1970s at the earliest.

24. The investment required to exploit the Tougue deposit would exceed that for Boke. New port facilities and a new railroad would be needed because of Tougue's isolated location and the limited capacity of existing facilities. Tougue is more than twice as far inland as Boke, and the terrain is hilly with some mountains. Thus the railroad and infrastructure easily could cost more than twice the \$85 million estimated for Boke's infrastructure. The size and quality of the Tougue deposits must still be ascertained, but they are likely to be smaller and of lower quality than those at Boke. Aluminum Suisse, moreover, still is looking for additional partners, without whom the project could not be financed.

Soviet Participation

25. The USSR agreed in November 1969 to exploit a deposit of 70 million tons of bauxite near Kindia, which had been rejected by Western companies as not commercially worthwhile. The alumina content varies between 37% and 41%, classifying the deposit as low grade and not exportable by Western standards. Operations are planned to begin in 1973 with production goal of 2.5 million tons annually. The price of Kindia bauxite to the USSR will be determined by the prevailing world price for ore of similar quality, and provisions have been made for price revisions every ten years. The USSR has agreed to take 75% of Kindia's bauxite for a period of 30 years. Of the total annual production, 50% will be applied against principal and interest of Soviet credits relating to Kindia and to previous Soviet-Guinean economic credits. An additional 25% will

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go to the USSR under terms of existing bilateral trade agreements. The remaining 25% will be left for disposal by the Guinean government, which may be difficult because of the bauxite's low quality.

26. The USSR will finance the project and participate actively in its implementation. A \$92 million loan includes up to \$37 million worth of Soviet merchandise to generate the necessary local currency. An Office des Bauxites de Kindia (OBK), established to oversee every aspect of the project, probably will be subject to substantial Soviet guidance. Besides constructing mining facilities and providing equipment and technical training, Moscow has agreed to build a new standard-gauge railroad, linking the mine and Conakry, and a dock with two berths and loading installations at Conakry. As of December 1970, however, no major construction was under way.

27. The USSR's willingness to develop the Kindia site and import nearly 2 million tons annually of its low-grade bauxite reflects not only its political interest in Guinea but also its rapidly growing need to import bauxite and alumina. In 1969, to supplement its domestic production of approximately 5 million tons of bauxite and 3 million tons of low-grade aluminous ores, the USSR imported 1.4 million tons of bauxite and 596,000 tons of alumina (the equivalent of somewhat more than 1 million tons of bauxite)*. Soviet bauxite imports were only 428,000 tons in 1960. Kindia's bauxite is of better quality than the non-bauxite ores from which aluminum is produced in the USSR, and the transportation costs will not be significantly greater than for bauxite from other sources.

* In 1969 the USSR imported 44,100 tons of bauxite and 5,000 tons of alumina from Guinea. Major imports of bauxite, however, came primarily from Greece and Yugoslavia; imports of alumina came mainly from the United States, Hungary, Greece, and France.

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Conclusions

28. Guinea could become the world's third largest bauxite producer by 1974. With production from the Boke and Kindia projects, output will rise from about 3 million tons in 1970 to at least 10 million tons and possibly 13 million tons by 1974, or some 3 million tons higher than reached in Jamaica, the world's largest producer, in 1969. Marketing apparently poses no special problem, as most of the planned production already is consigned to the developing corporations and countries.

29. Already the major source of foreign exchange, the bauxite industry in a few years will generate an unprecedented quantity -- for Guinea -- of foreign exchange. Gross foreign exchange receipts from FRIA and Boke alone could reach \$76 million in 1973, about \$20 million more than total export earnings in 1970 (\$56 million, including \$37 million from alumina and bauxite). By the early 1980s the two projects may gross \$130 million of export earnings annually. The Guinean government's net earnings in 1973, after associated debt payments, could be more than \$18 million and by the early 1980s, as much as \$50 million annually. Additional small amounts of foreign exchange will accrue to the government from Tamara until the deposits are depleted in 1973 and from Kindia -- should the Soviet-sponsored project get under way -- if markets can be found for the 25% of production earmarked for the government's disposal. If the Tougue project goes through, it probably will commence operations at about the time production from Boke is leveling off and thus will extend the rising trend in foreign exchange receipts from bauxite well into the 1980s.

30. The bauxite industry, while retaining some of the characteristics of an enclave, will nevertheless spur development of inland, underdeveloped regions of Guinea. OFAB, responsible for infrastructure construction at Boke, already has begun a campaign to bring about full-scale regional economic development in the Boke area. About 22 miles of a proposed 217-mile road linking Boke and the town of Mali in northwest Guinea have been completed by an Italian firm with financing from a consortium

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of Italian banks. OFAB also is working with a Peace Corps consultant to begin an experimental farm, which will help support long-term agricultural development in the Boke region. The proposed infrastructure for the Tougue and Kindia projects likewise should develop comparable opportunities in other regions of Guinea.

31. The exemplary training program at FRIA and that planned for Boke will play a major role in helping Guinea overcome its primary manpower problem -- the lack of modern technical and administrative skills. Although each project primarily serves its own needs, the training programs provide an organizational model that can be applied to the railroad, port establishments, and other development projects.

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